

Name: KEY Hour: \_\_\_\_\_ Date: \_\_\_\_\_

## QUICK REVIEW – Sections 6.1 – 6.2

Goals: #1 - I can interchange an expression between rational and radical notation, and evaluate the expression (using a calculator).

#2 - I can evaluate a rational or radical expression (without using a calculator).

#3 - I can solve equations using  $n^{\text{th}}$  roots.

#4 - I can simplify a numerical expression using properties of radicals and rational exponents.

#5 - I can simplify a variable expression using properties of radicals and rational exponents.

#6 - I can add and subtract expressions with radicals and rational exponents.



Let's keep practicing!: Evaluate the expression without using a calculator.

1.)  $8^{2/3}$   
 $(\sqrt[3]{8})^2$   
 $(2)^2$   
 $\boxed{4}$

3.)  $-125^{4/3}$   
 $-(\sqrt[3]{125})^4$   
 $-(5)^4$   
 $\boxed{-625}$

2.)  $81^{-3/2}$   
 $\frac{1}{81^{3/2}}$   
 $\frac{1}{(\sqrt{81})^3}$   
 $\frac{1}{(9)^3} = \frac{1}{729}$

4.)  $(-32)^{3/5}$   
 $(\sqrt[5]{-32})^3$   
 $(-2)^3$   
 $\boxed{-8}$

Evaluate the expression using a calculator. Round answers to the nearest hundredth.

5.)  $\sqrt{-230}$   
 $(-230)^{1/4}$   
 $\boxed{-1.83}$

6.)  $25^{-1/3}$   
 $\boxed{0.34}$

7.)  $(\sqrt[4]{187})^3$   
 $(187)^{3/4}$   
 $\boxed{50.57}$

Solve the equation. Round your answer to two decimal places when necessary.

8.)  $3x^5 + 18 = -12$   
 $-18 \quad -18$   
 $3x^5 = -30$   
 $x^5 = -10$   
 $\sqrt[5]{x^5} = \sqrt[5]{-10}$   
 $x \approx -1.58$

9.)  $(x + 4)^4 = 21$   
 $\sqrt[4]{(x+4)^4} = \pm \sqrt[4]{21}$   
 $x + 4 = \pm 2.14$   
 $x \approx -1.86, -6.14$

Simplify the expression. Assume all variables are positive.

10.)  $x^{2/3} \cdot x^{1/4}$   
 $x^{2/3 + 1/4}$   
 $x^{8/12 + 3/12}$   
 $x^{11/12}$

11.)  $(\sqrt{x} \cdot \sqrt[3]{x})^6$   
 $(x^{1/2} \cdot x^{1/3})^6$   
 $(x^{3/6} \cdot x^{2/6})^6$   
 $(x^{5/6})^6$   
 $x^5$

12.)  $\sqrt[5]{\frac{3}{4}}$   
 $\frac{\sqrt[5]{3}}{\sqrt[5]{4}} \cdot \frac{\sqrt[5]{8}}{\sqrt[5]{8}}$   
 $\frac{\sqrt[5]{24}}{\sqrt[5]{32}} = \frac{\sqrt[5]{24}}{2}$

13.)  $\sqrt[4]{80} + 3\sqrt[4]{405}$   
 $\sqrt[4]{16} \sqrt[4]{5} + 3 \sqrt[4]{81} \sqrt[4]{5}$   
 $2\sqrt[4]{5} + 3 \cdot 3 \sqrt[4]{5}$   
 $2\sqrt[4]{5} + 9\sqrt[4]{5}$   
 $11\sqrt[4]{5}$

14.)  $\sqrt[5]{6xy^3z^2} \cdot \sqrt[5]{16x^5yz^8}$   
 $\sqrt[5]{96x^6y^4z^{10}}$   
 $\sqrt[5]{32 \cdot 3 \cdot x^5 \cdot x \cdot y^4 \cdot z^5 \cdot z^5}$   
 $2xz^2 \sqrt[5]{3xy^4}$

15.)  $\frac{\sqrt[4]{96x^3y^6}}{\sqrt[4]{4y^2}}$   
 $\sqrt[4]{24x^3y^4}$   
 $y \sqrt[4]{24x^3}$

16.)  $\sqrt[3]{\frac{6x^6}{5}}$   
 $\frac{\sqrt[3]{6x^6}}{\sqrt[3]{5}} \cdot \frac{\sqrt[3]{25}}{\sqrt[3]{25}}$   
 $\frac{\sqrt[3]{150x^6}}{\sqrt[3]{125}} = \frac{x^2 \sqrt[3]{150}}{5}$